

A0- Characterization of the *Picosecond Pulsed Fiber Laser*

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Abstract: The *Picosecond Pulsed Fiber Laser* (PSL) laser will act as the *new seed laser* in the New Muon Lab Test Area at Fermilab National Accelerator Laboratory. The Nd:YLF laser currently running in A0 laboratory is the model which the PSL is based on. The PSL will produce a train of pulses at 81.25 MHz with a wavelength of 1054 nm and a pulse width of 5 ps. The stability of the seed laser is crucial to the success of A0 Photoinjector's mission, which is to provide stable electron bunches for research and diagnostics. With a phase lock loop directly operating at a 1.3 GHz clock, the new PSL system is more suitable for this application. In order to directly compare the PSL to the current A0 seed laser system the laser is being characterized for the duration of the summer program. The results of these tests concluded that the laser exhibits significant power drift with time. This drift is attributed to the shifting of the modulator bias component in the laser. A proposed solution for this issue is a feedback circuit that will adjust the modulator voltage for optimal power and mode locking. This modulator bias difficulty will be further looked at succeeding the completion of the summer session.